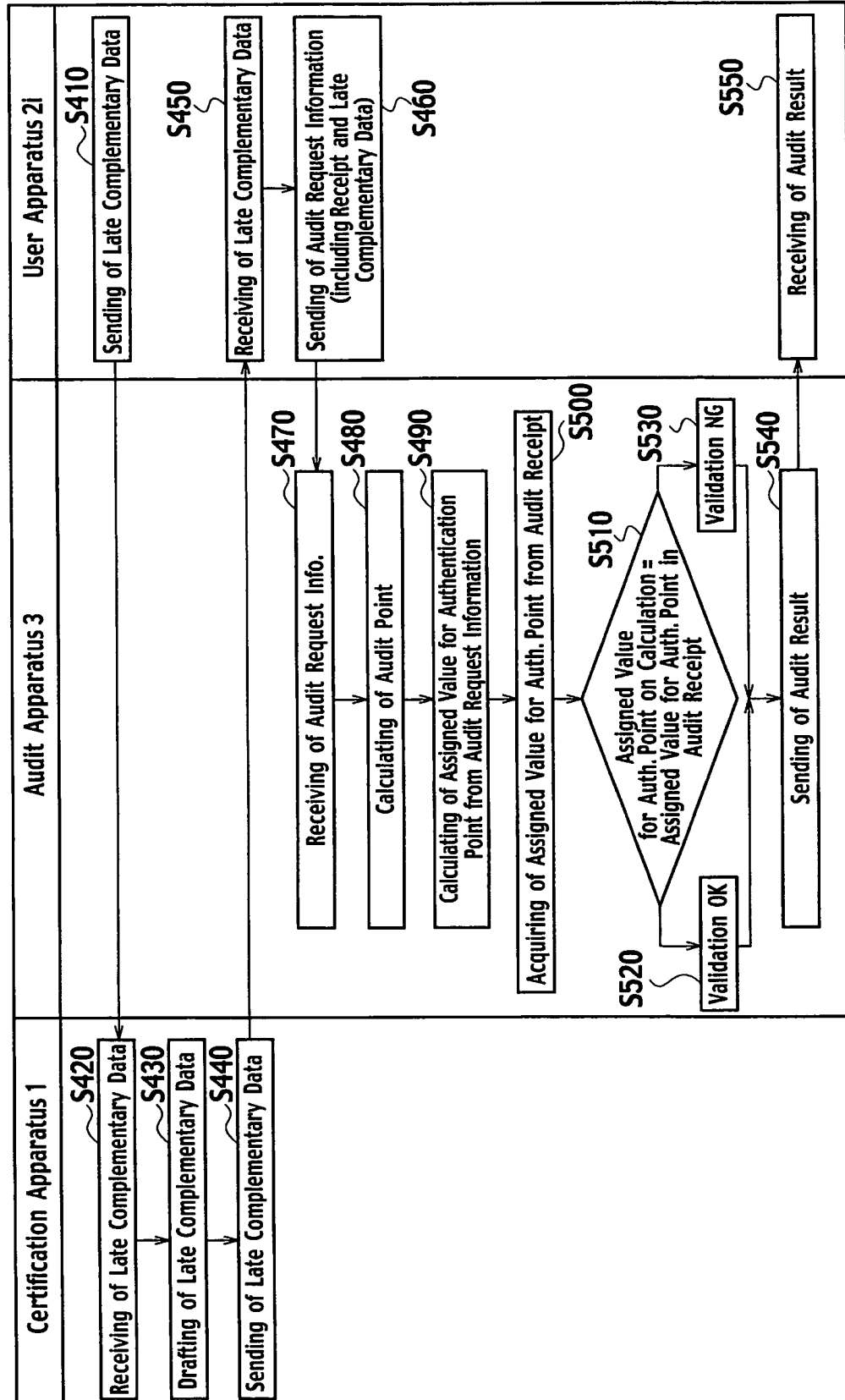


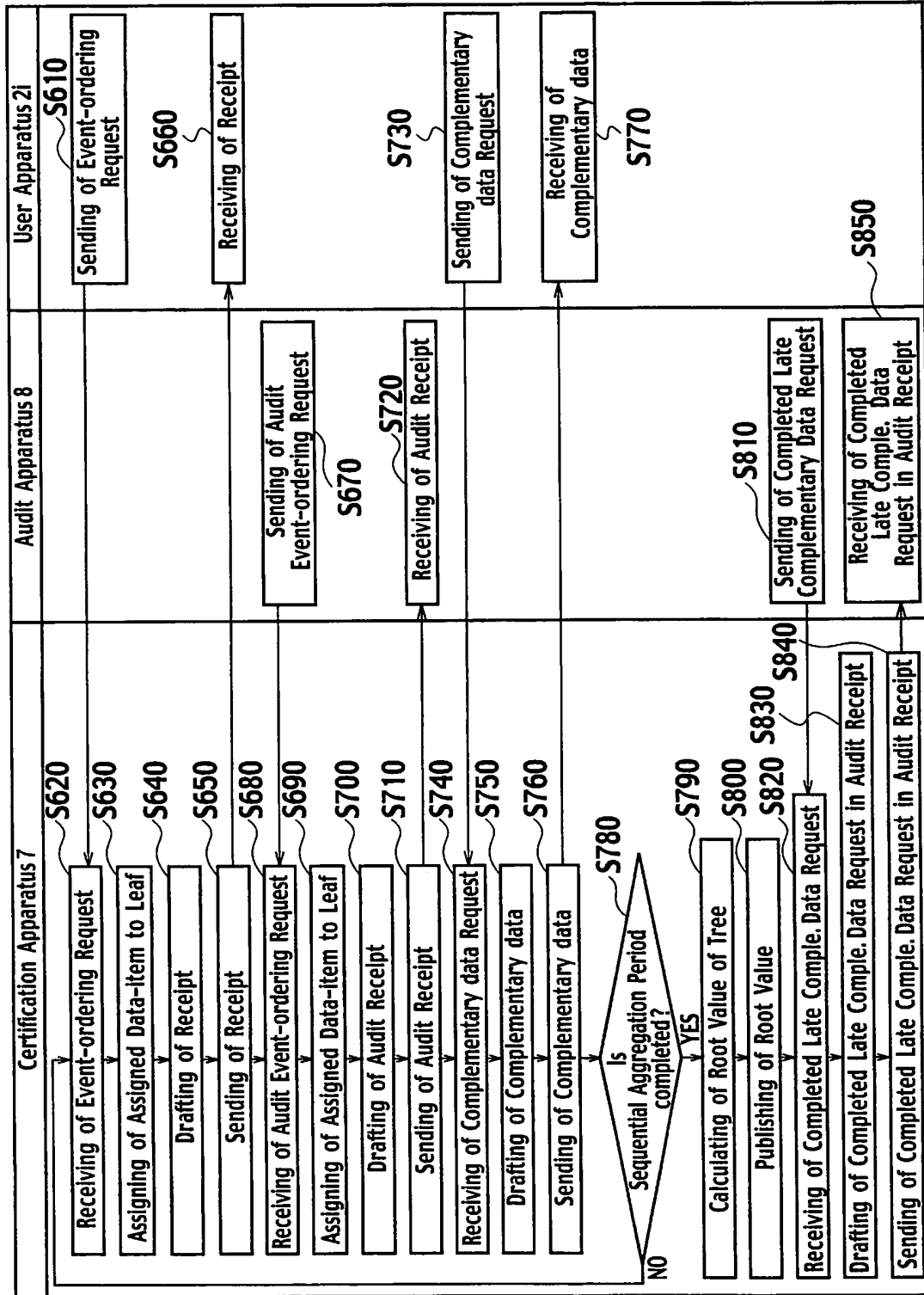
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FIG. 10



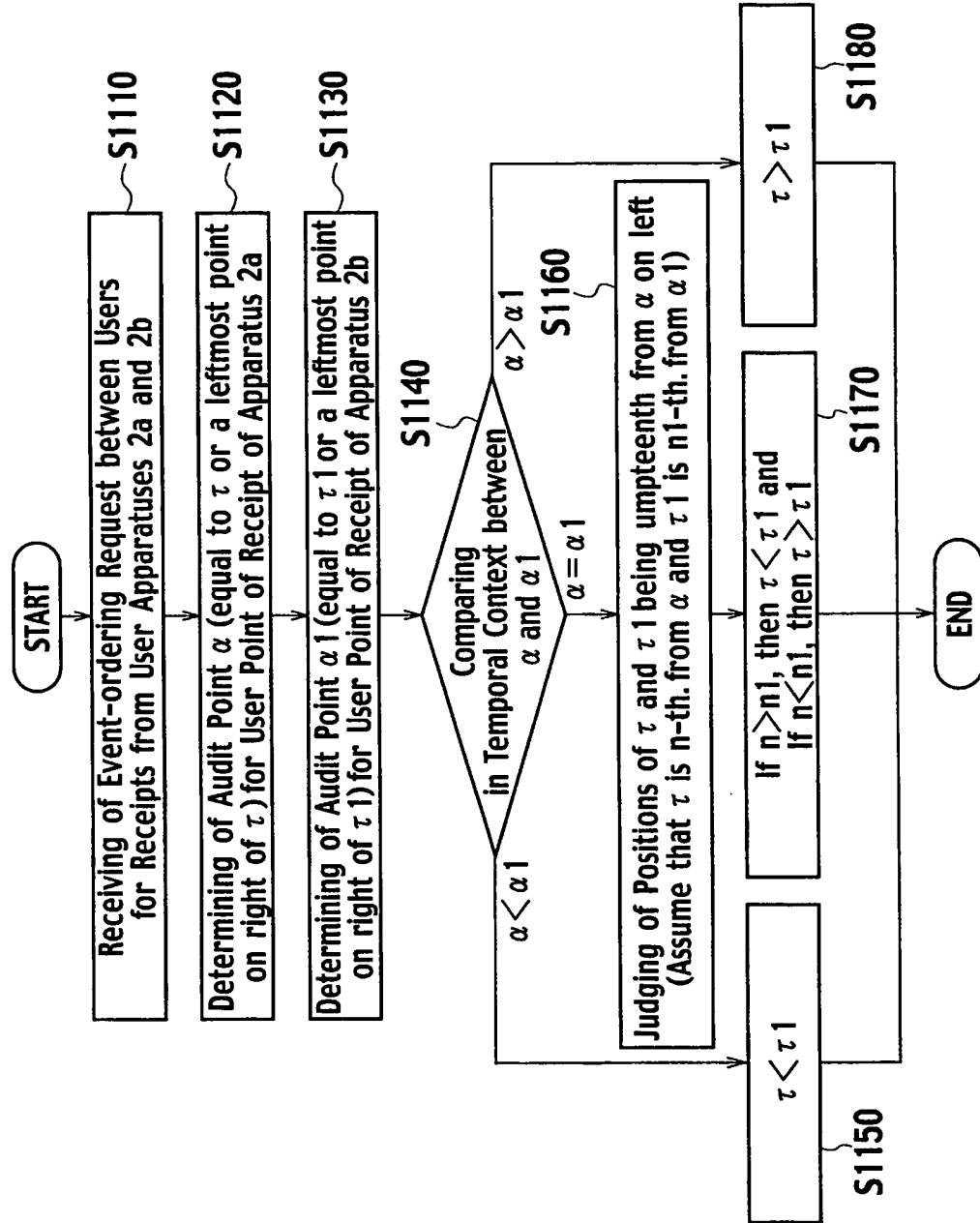
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FIG. 15



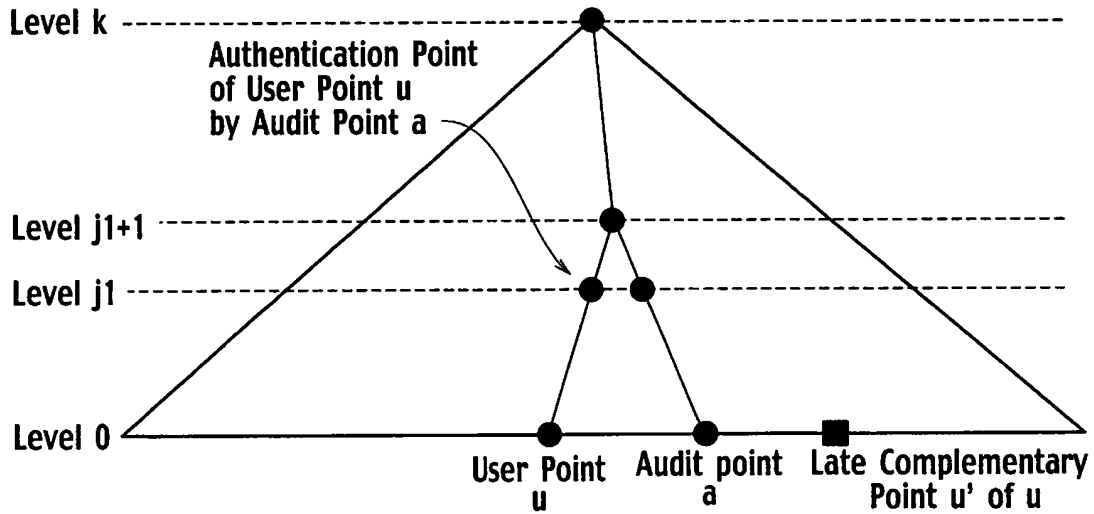
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FIG. 17



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**FIG. 19**



**FIG. 20**

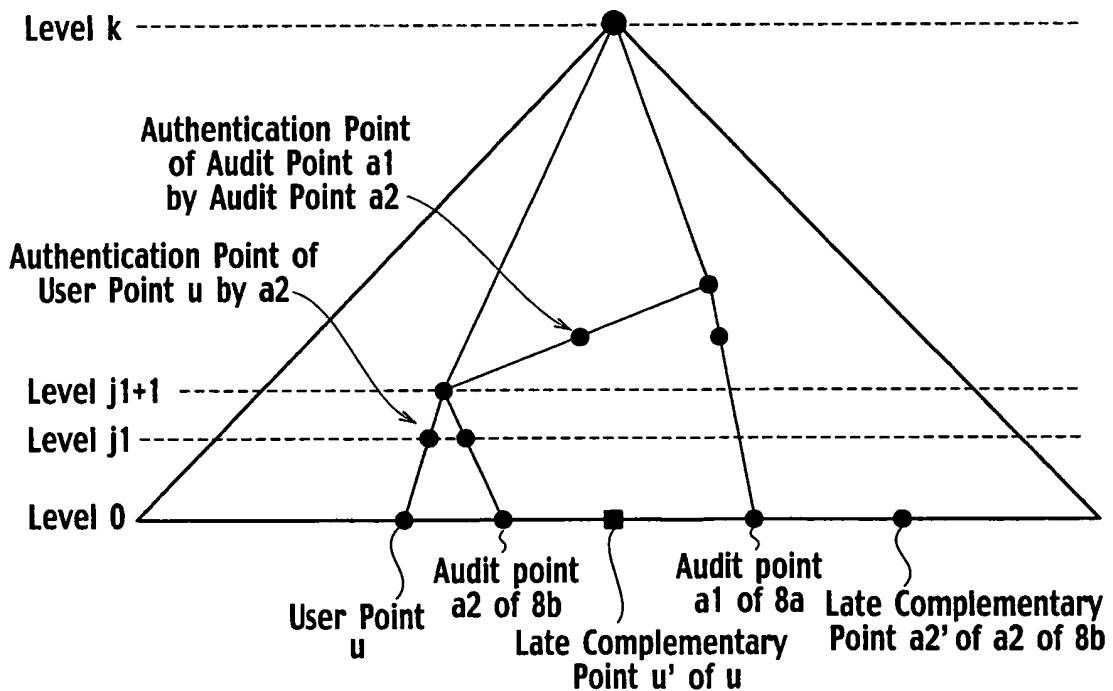


FIG. 24

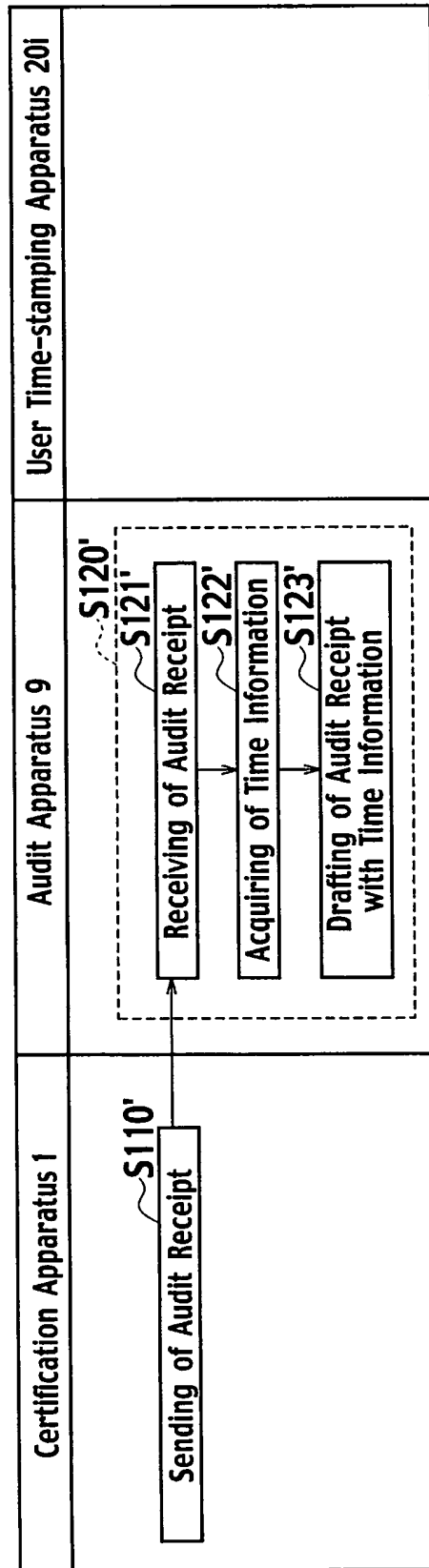
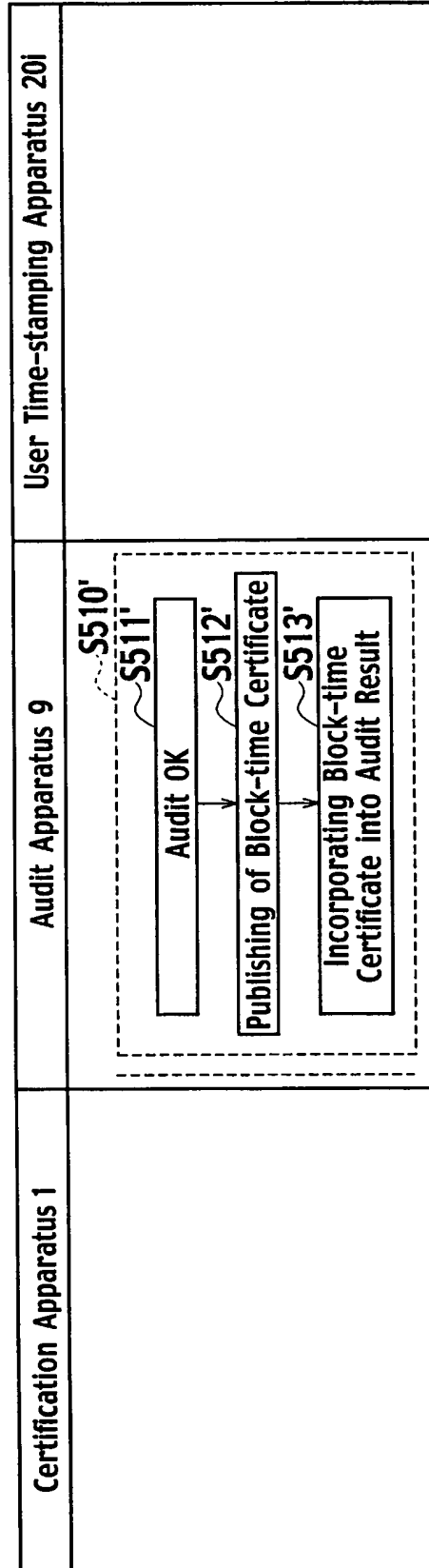


FIG. 25



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FIG. 27

Processing Procedure 1

(1) Loop 1: In a constructive method No. 3, the following processes are repeated until a regular time interval is completed.

(1.1) Setting a request on acceptance to x

(1.2) Increasing n by increment of 1

(1.3) Loop 2: Performing of the follow processes for  $j=0, \dots, k$

(1.3.1)  $i \rightarrow ij$

(1.3.2) When  $j = 0$ , set  $A_j[i] := x$ .

(Set x to  $\text{node}(j, ij)$ .)

(1.3.3) When  $j > 0$ , perform as follows.

• Set  $x0 := A_{j-1}[\text{index}(\text{leftChild}(j, i))]$

(Set x0 to an assigned value for left-child of  $\text{node}(j, i)$ .)

• Set  $x1 := A_{j-1}[\text{index}(\text{rightChild}(j, i))]$

(Set x1 to an assigned value for right-child of  $\text{node}(j, i)$ .)

• Calculate  $x2 := h(x0 \parallel x1)$

• Set  $A_j[i] := x2$

(Assign x2 to  $\text{node}(j, i)$ .)

(1.3.4) Increasing  $ij$  by increment of 1

(1.3.5) Withdraw from loop 2 if i is an even number.

Completion of loop 2

Completion of loop 1

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## FIG. 28

- (2) Performing of the following processes after withdrawing from loop 1 on reaching finish time.
- (2.1) Set  $k := \text{ceiling}(\log_2(n))$ .
  - (2.2) Calculate  $\text{rtPath}(k, 0, n-1)$  and Set  $((0, r(0), \dots, k, r(k)))$  to the calculation result.
  - (2.3) Loop 3: Performing of the follow processes for  $j=0, \dots, k$ 
    - (2.3.1)  $i \rightarrow i_j$
    - (2.3.2) Case of  $j = 0$ :
      - (2.3.2.1) When  $i$  is an odd number:
        - Produce a dummy  $r := R(0, i)$
        - Set  $A_j[i] := r$
        - (Assign  $r$  to  $\text{node}(0, i)$ .)
        - Set  $b_j := \text{true}$ .
        - Increase  $i_j$  by increment of 1.
    - (2.3.3) Case of  $0 < j \leq k$ :
      - (2.3.3.1) When  $i = r(j)$ :
        - (when  $\text{node}(j, i)$  is on  $\text{rtPath}(k, 0, n-1)$ ):
        - (2.3.3.1.1)  $x0 := A_{j-1}[\text{index}(\text{leftChild}(j, i))]$
        - (Set  $x0$  to an assigned value for left-child of  $\text{node}(j, i)$ .)
        - (2.3.3.1.2)  $x1 := A_{j-1}[\text{index}(\text{rightChild}(j, i))]$
        - (Set  $x1$  to an assigned value for right-child of  $\text{node}(j, i)$ .)
        - (2.3.3.1.3) Calculate  $x2 := h(x0 \parallel x1)$
        - (2.3.3.1.4) Set  $A_j[i] := x2$
        - (Assign  $x2$  to  $\text{node}(j, i)$ .)
      - (2.3.3.1.5) When  $i$  is an even number and  $j < k$ :
        - Increase  $i$  by increment of 1.
        - Calculate  $r := R(j, i)$  and Set  $A_j[i] := r$
        - (Assign  $r$  to  $\text{node}(j, i)$ .)
        - Set  $b_j := \text{true}$ .
        - Set  $i_j := i + 1$
    - (2.3.3.2) When  $i = r(j) + 1$ , an odd number and  $j < k$ :
      - Calculate  $r := R(j, i)$  and Set  $A_j[i] := r$
      - (Assign  $r$  to  $\text{node}(j, i)$ .)
      - Set  $b_j := \text{true}$ .
      - Increase  $i_j$  by increment of 1.
- Completion of loop 3

Processing Procedure 2

FIG. 40

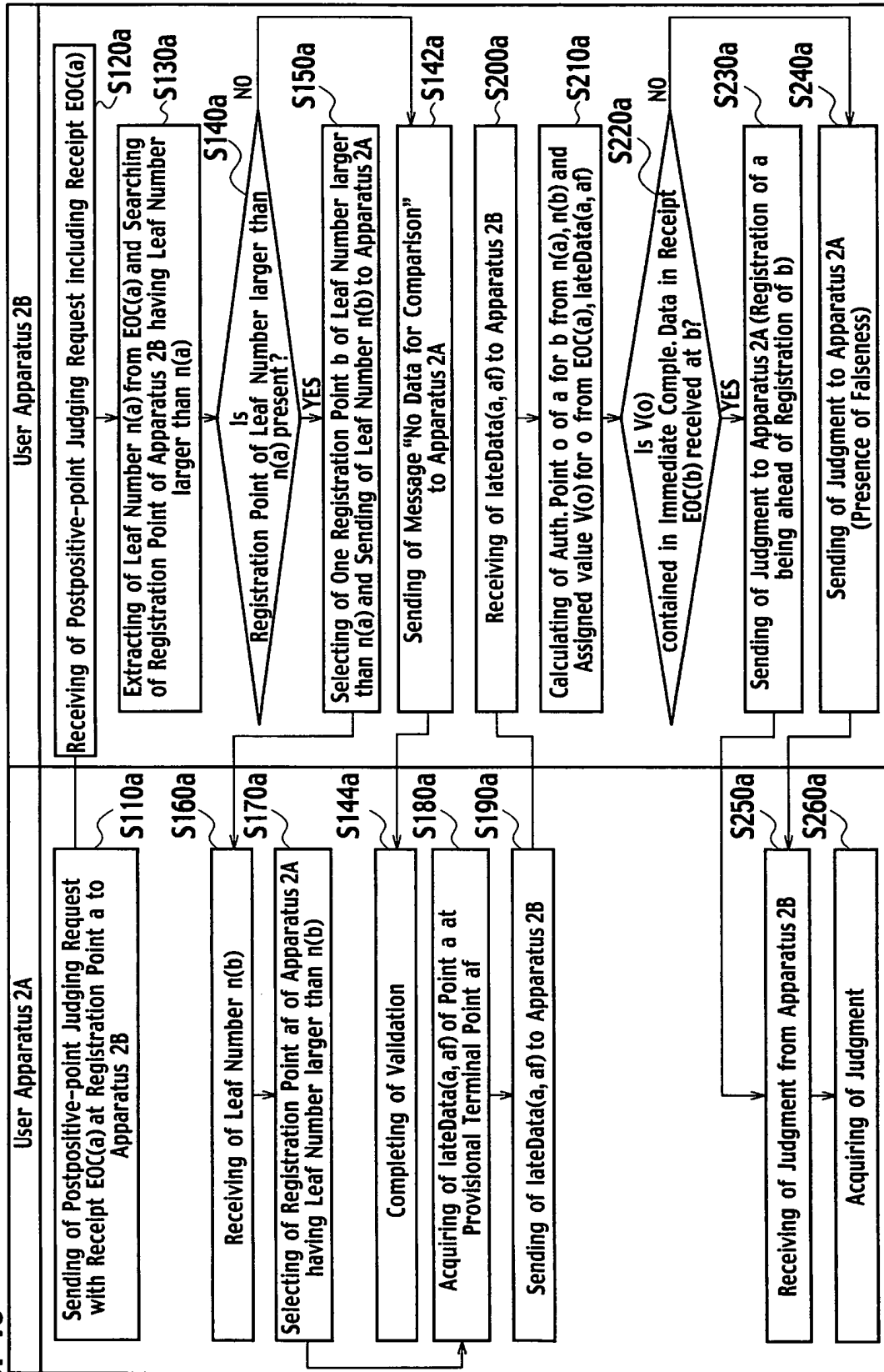
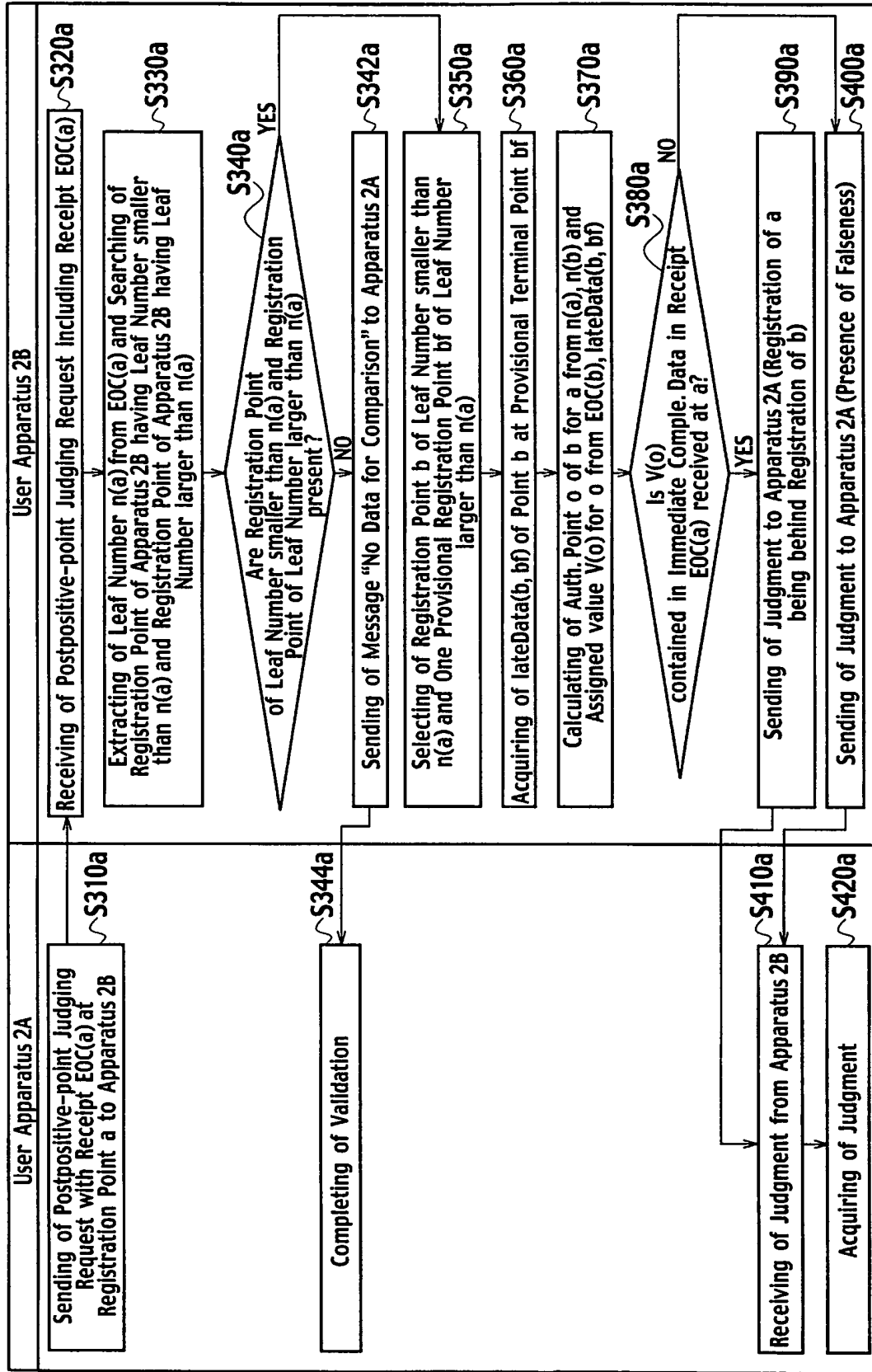
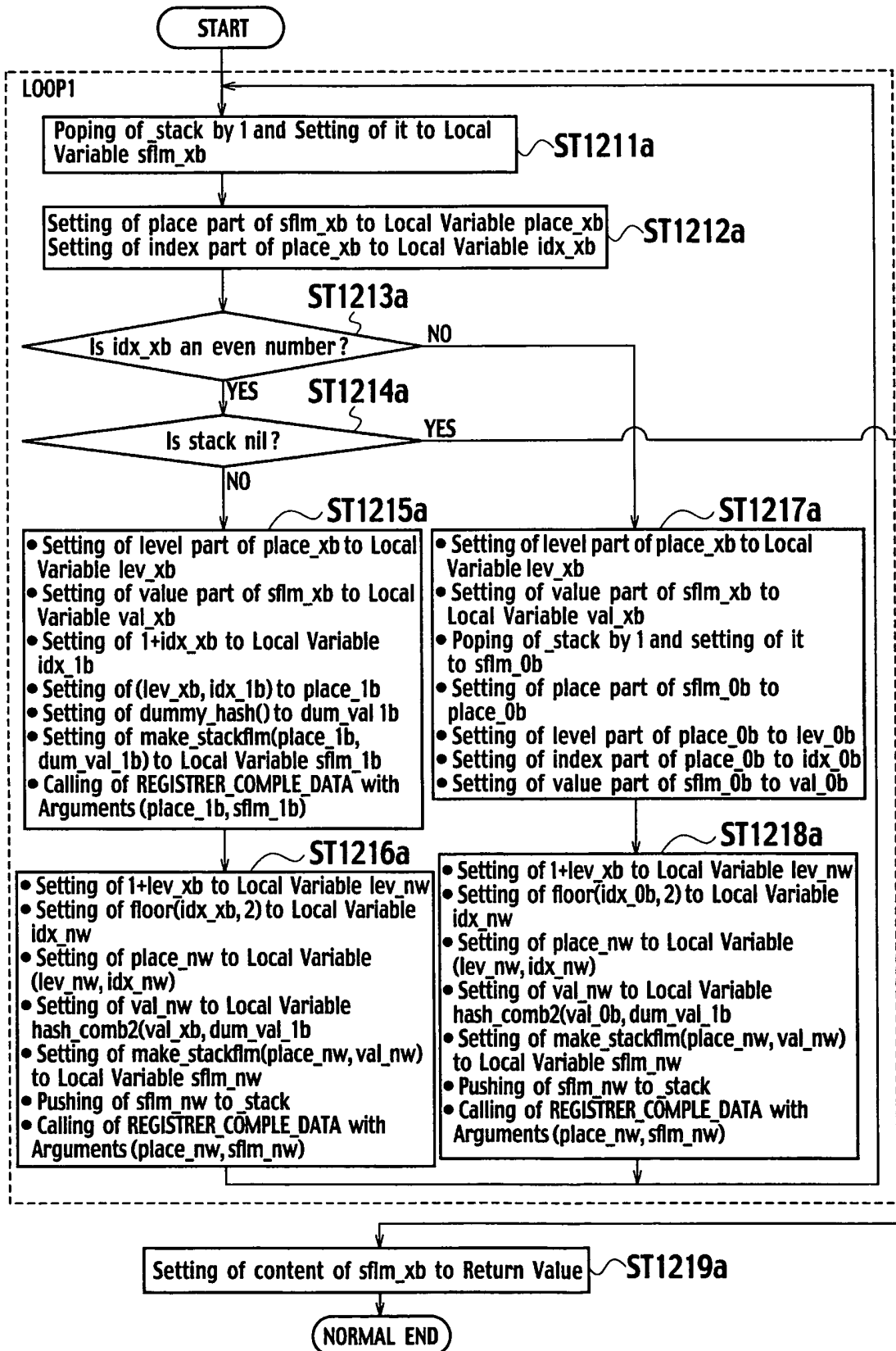


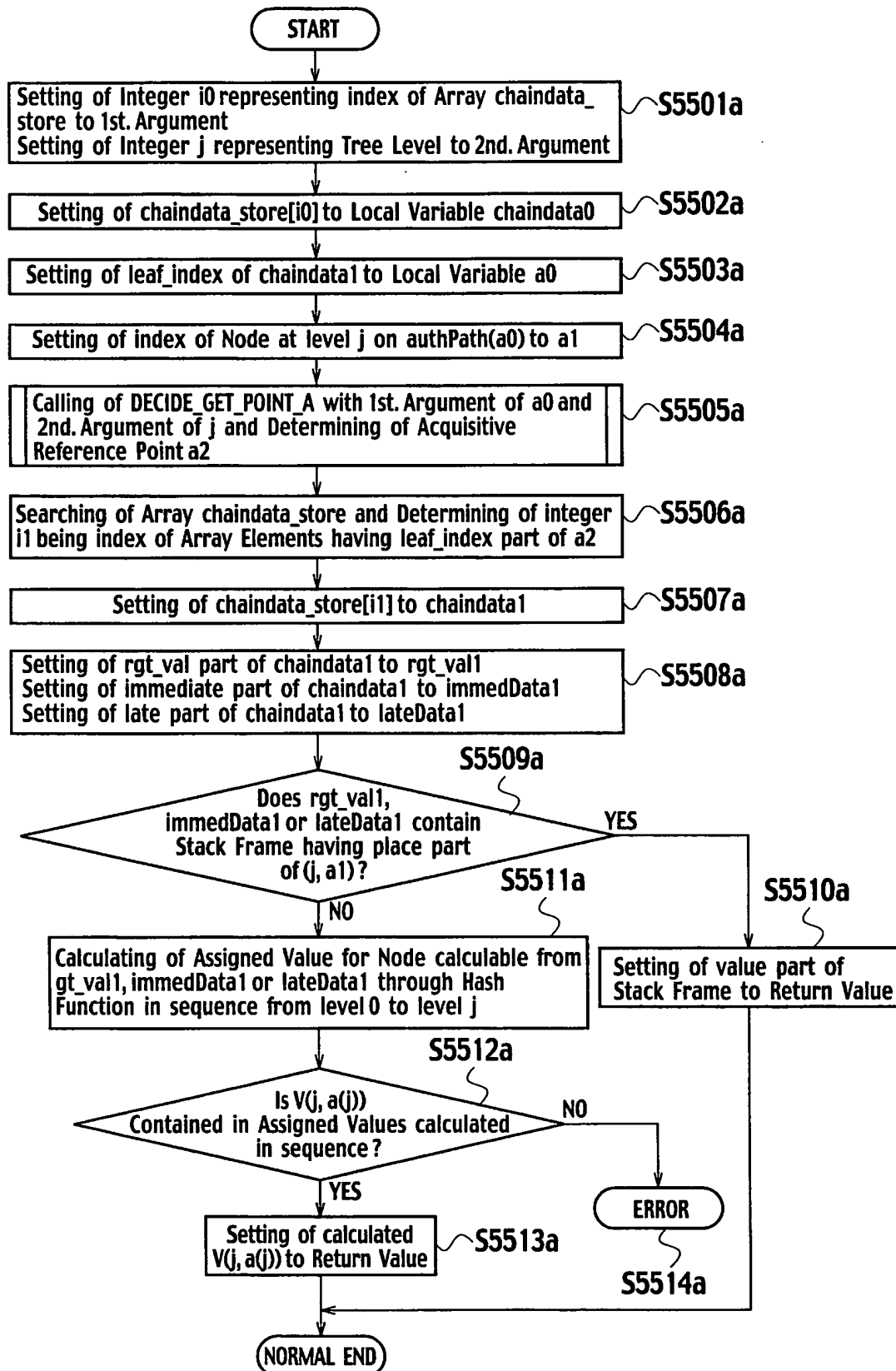
FIG. 41



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**FIG. 55**

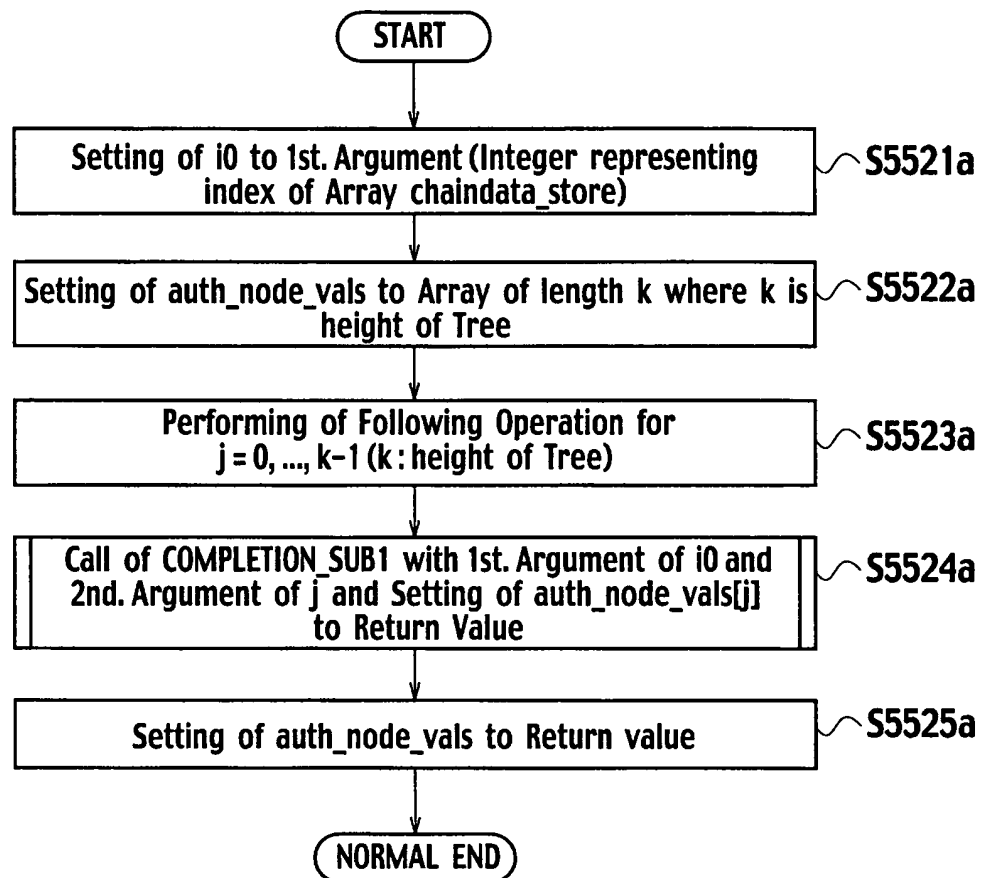


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**FIG. 66**

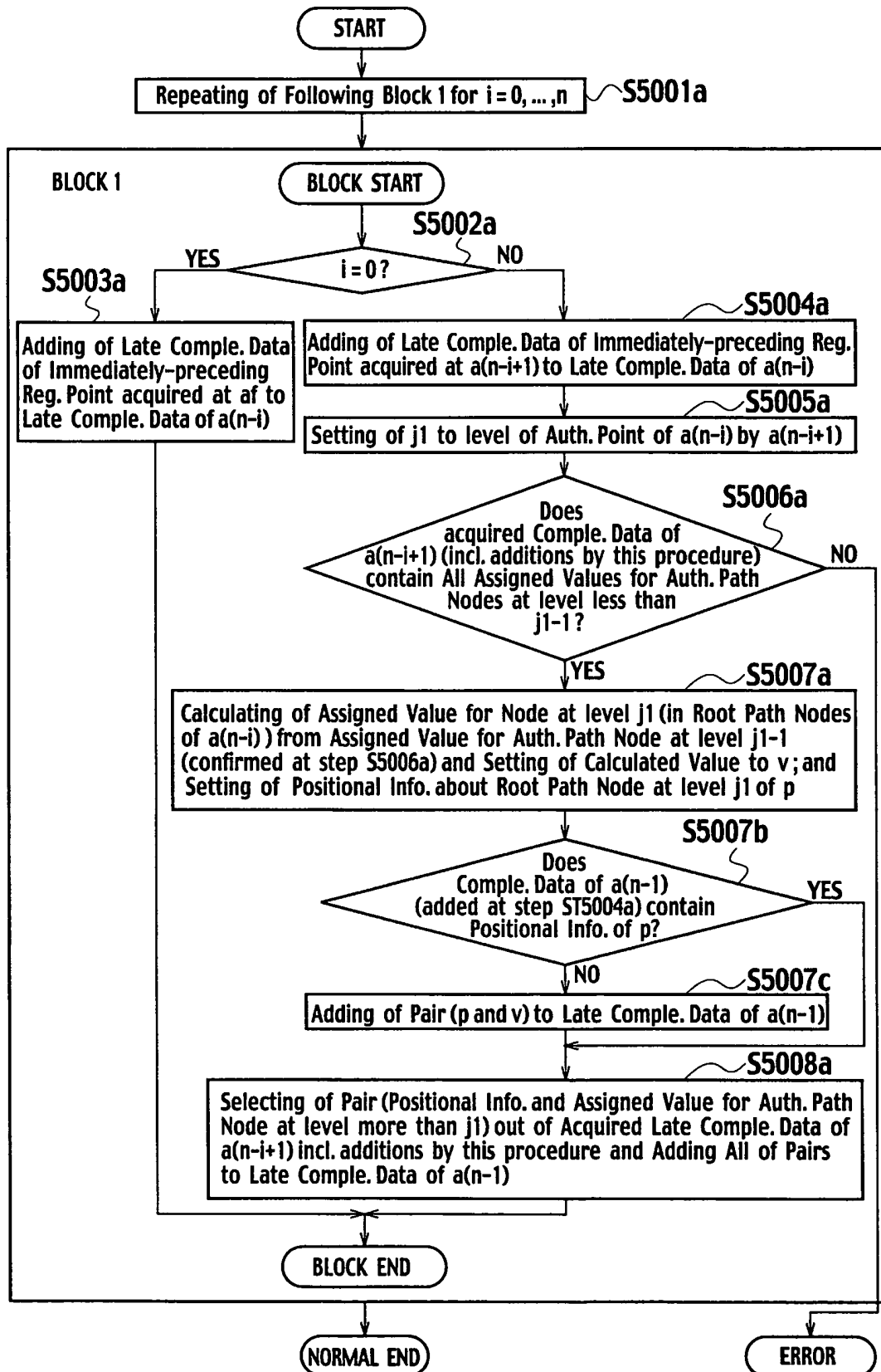


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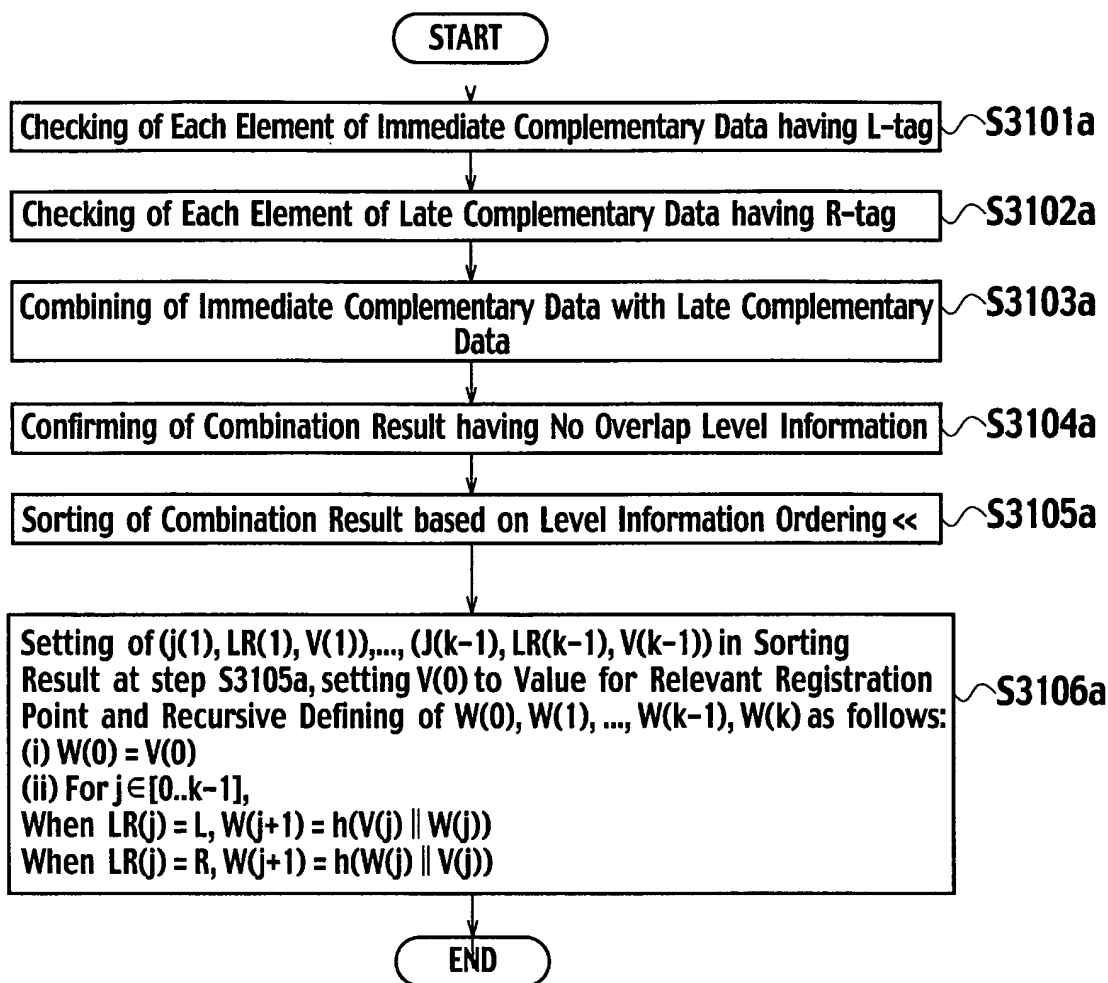
**FIG. 67**



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**FIG. 68**



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**FIG. 76**



**FIG. 77**

